REQUEST FOR QUOTATION
(THIS IS NOT AN ORDER)

THIS RFQ [X] IS [ ] IS NOT A SMALL BUSINESS SET-ASIDE

PAGE 1 OF PAGES 52

1. REQUEST NO.	2. DATE ISSUED	3. REQUISITION/PURCHASE REQUEST NO.	4. CERT. FOR NAT. DEF. UNDER BDSA REG. 2 AND/OR DMS REG. 1	RATING
EP09L000226	09.21.09			

5a. ISSUED BY
US EPA ERD, 960 College Station Rd., Athens, GA 30605

6. DELIVER BY *(Date)*
60 Days ARO

5b. FOR INFORMATION CALL *(NO COLLECT CALLS)*

NAME	TELEPHONE NUMBER	
	AREA CODE	NUMBER
Rick Pittman	706	355.8010

7. DELIVERY
[X] FOB DESTINATION [ ] OTHER *(See Schedule)*

9. DESTINATION

a. NAME OF CONSIGNEE
US EPA ERD

8. TO:

a. NAME

b. COMPANY

b. STREET ADDRESS
625 Bailey Road

c. STREET ADDRESS

c. CITY
Athens

d. CITY

e. STATE

f. ZIP CODE

d. STATE
GA

e. ZIP CODE
30605-2700

10. PLEASE FURNISH QUOTATIONS TO THE ISSUING OFICE IN BLOCK 5a ON OR BEFORE ~~CLOSE OF BUSINESS~~ *(Date)*
10.01.09 by 10:00 AM

IMPORTANT: This is a request for information, and quotations furnished are not officers. If you are unable to quote, please so indicate on this form and return it to the address in Block 5a. This request does not commit the Government to pay any costs incurred in the preparation of the submission of this quotation or to contract for supplies or service. Supplies are of domestic origin unless otherwise indicated by quoter. Any representations and/or certifications attached to this Request for Quotation must be completed by the quoter.

11. SCHEDULE *(Include applicable Federal, State and local taxes)*

ITEM NO. (a)	SUPPLIES/ SERVICES (b)	QUANTITY (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)
0001	Contractor shall furnish plumbing to and make modifications in Battery Storage Building as specified in the attached statement of work. NAICS Code: 238220 Size Standard: $13,000,000 DUNS #: _____ TIN #: _____ With quotation, complete and submit pages 1, 3, and 4. Contact for information and submit quotes by fax or mail to: Rick Pittman, PH 706.355.8010, Fax 706.355.8026, email - pittman.rick@epa.gov All responsible sources may submit a response which, if timely received, must be considered by the agency.	1	Job		$ _____

12. DISCOUNT FOR PROMPT PAYMENT	a. 10 CALENDAR DAYS (%)	b. 20 CALENDAR DAYS (%)	c. 30 CALENDAR DAYS (%)	d. CALENDAR DAYS NUMBER	d. CALENDAR DAYS PERCENTAGE

NOTE: Additional provisions and representations [X] are [ ] are not attached.

13. NAME AND ADDRESS OF QUOTER	14. SIGNATURE OF PERSON AUTHORIZED TO SIGN QUOTATION	15. DATE OF QUOTATION
a. NAME OF QUOTER		
b. STREET ADDRESS	16. SIGNER	
c. COUNTY	a. NAME *(Type or print)*	b. TELEPHONE AREA CODE
d. CITY / e. STATE / f. ZIP CODE	c. TITLE *(Type or print)*	NUMBER

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SECTION 00010 Solicitation Contract Form

3

CONTRACTOR INFORMATION:

Company Name: _____

Point of Contact: _____

Address: _____

_____

Phone No: _____ **Fax No:** _____

E-Mail Address: _____

Tax ID No: _____ **DUNS No:** _____

ITEM NO	SUPPLIES/ SERVICES	QUANTITY	UNIT	AMOUNT
0001	Total cost of job	1	JOB	$_____

PLUMBING FOR GROUNDWATER TANK BUILDING, ENVIRONMENTAL PROTECTION AGENCY, ATHENS, GA

The contractor shall furnish all labor, materials, transportation, equipment, and supervision necessary to perform work as specified in solicitation EP09L000226, complete and ready for use.

ESTIMATED COST OF CONSTRUCITON: $2,500 - $25,000

Wage determination GA080253, dated 07.24.09, BUILDING (Clarke County) is hereby attached and incorporated.

SET-ASIDE: Total Small Business Set-Aside

NAICS Code: 238220 $13.0M

DELIVERY OF SERVICES SHALL BE AS SCHEDULED. COMPLETION IS ANTICIPATED TO BE WITHIN 60 CALENDAR DAYS AFTER AWARD.

****QUOTES ARE DUE 01 OCTOBER 2009 NO LATER THAN 10:00 AM****

Quotes can be faxed to 706.355.8026 or emailed to: pittman.rick@epa.gov

Point of Contact: Rick Pittman, PH 706.355.8010
Email: pittman.rick@epa.gov

FAR 52.204-8 -- Annual Representations and Certifications (Jan 2006)

(a)

(1) The North American Industry classification System (NAICS) code for this acquisition is 238330.

(2) The small business size standard is $13.0M.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b)

(1) If the clause at 52.204-7, Central Contractor Registration, is included in this solicitation, paragraph (c) of this provision applies.

(2) If the clause at 52.204-7 is not included in this solicitation, and the offeror is currently registered in CCR, and has completed the ORCA electronically, the offeror may choose to use paragraph (c) of this provision instead of completing the corresponding individual representations and certification in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

[ ] (i) Paragraph (c) applies.

[ ] (ii) Paragraph (c) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(c) The offeror has completed the annual representations and certifications electronically via the Online Representations and Certifications Application (ORCA) website at http://orca.bpn.gov . After reviewing the ORCA database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below *[offeror to insert changes, identifying change by clause number, title, date]*. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR Clause	Title	Date	Change

Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.

(End of Provision)

SECTION 00100 Bidding Schedule/Instruction to Bidders

THIS WILL NOT BE A PUBLIC OPENING: Pursuant to 10 USC 2304(g), the Government may award a contract based on initial quotes received, without discussion. Accordingly, initial proposals should be submitted on the most favorable terms, from a price and technical standpoint, which the offeror can submit to the Government.

BID ITEMS: Bid Item 0001 shall be the entire work complete in accordance with the drawings and specifications and listed on Standard Form 18 as 1 JOB.

BASIS FOR AWARD: The quoter for purposes of award shall be the conforming, responsive, responsible bidder offering a total price for the job. Quotes are solicited on an "all or none" basis, for the total job, complete and ready for use.

WHAT DO YOU NEED TO RETURN TO THE EPA TO QUOTE ON THIS PROJECT?

(1) STANDARD FORM 18 "REQUEST FOR QUOTATIONS" & SECTION 00010 COMPLETED AND SIGNED
(2) AMENDMENTS (if any) SIGNED AND DATED

This is a request for information, and quotations furnished are not to be construed as orders for work. This request does not commit the Government to pay any costs incurred in the preparation of the submission of this quotation or to contract for supplies or services.

Discounts offered may be taken, but will not be evaluated for award.

Quotes will not be disclosed publicly. Name and address of the successful quoter will only be disclosed if requested in writing.

Contractors are cautioned to base quotes on specifications as written. Clarifications of specifications shall be directed to the contract personnel only. Contract award will be made on specifications as written. Technical questions must be submitted in writing at least five (5) days before the due date. If you have any questions, please call Rick Pittman, telephone 706.355.8010 or e-mail pittman.rick@epa.gov.

Examination of Site: Contractors are encouraged to visit the site prior to submitting their proposals, inspect the work in place, and satisfy themselves as to the character and amount of work to be accomplished and to determine the exact nature and extent of the work involved. To see the job site please contact Rick Pittman.

CCR Registration: All offerors are required to be registered in the Central Contractor Registration (CCR) database in accordance with FAR 52.204-7. Lack of registration in the CCR database will make the offeror ineligible for award. The website address for CCR database is www.ccr.gov.

Online Representations and Certifications (ORCA): Online Representations and Certifications Application (ORCA) is an e-Government initiative that has been developed to replace most of the paper based Representations and Certifications process by creating an internet application. The ORCA site can only be accessed by going to http://www.bpn.gov and clicking on "Online Representations and Certifications" on the left side of the screen. In order to register in ORCA, contractor must be an active participant in CCR.

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SECTION 00102 List of Drawings

1.1 SUMMARY

This section lists the drawings for the project.

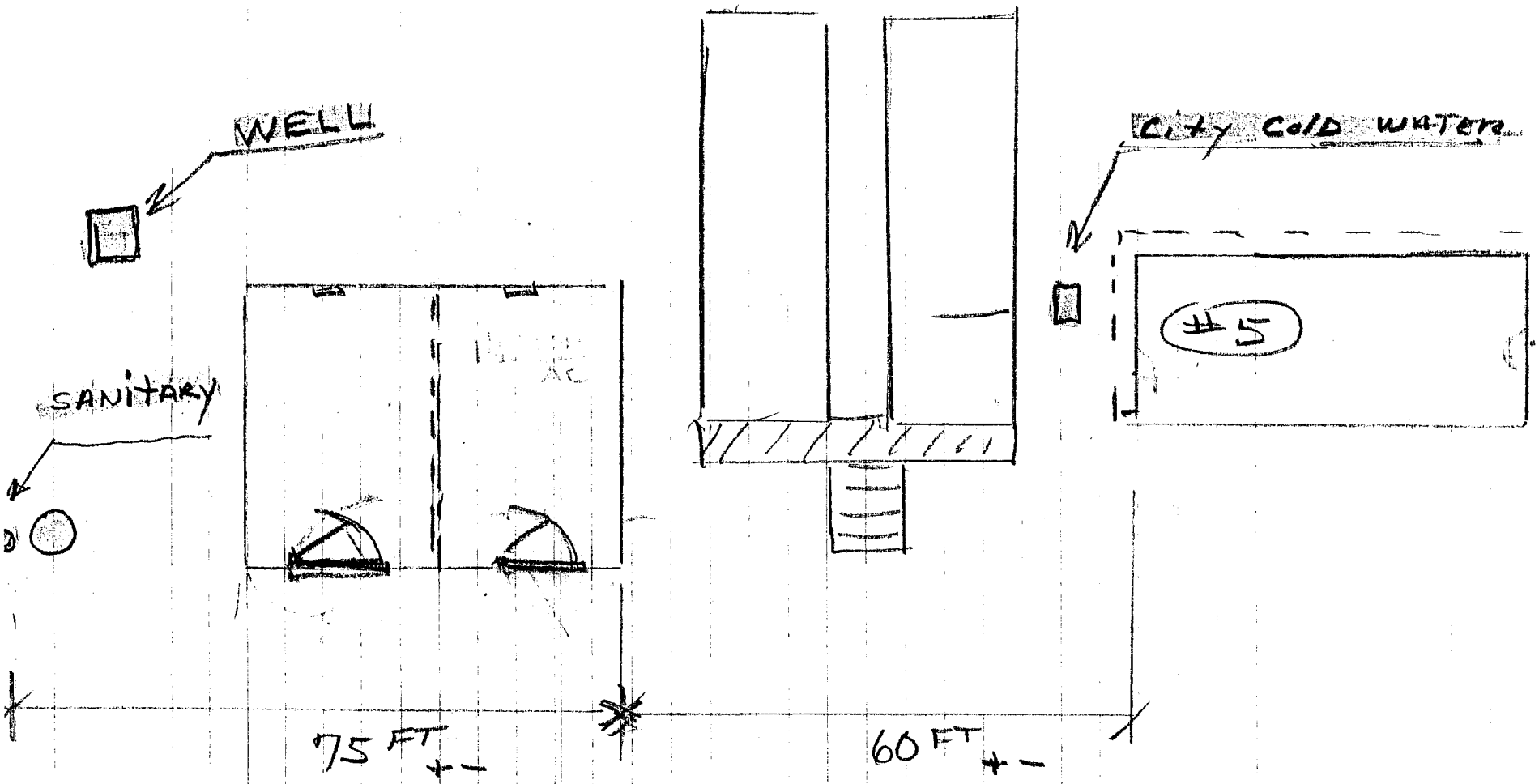
1.2 CONTRACT DRAWINGS

The following drawings/sketches accompany this specification and are a part thereof. Drawings/Sketches are the property of the government, and shall not be used for any purpose other than that contemplated by the specification:

Sketch/Drawing Number	Title/Description of Sketch/Drawing
1	Exterior Plumbing
2	Battery Shed Benches to Remove
3	Location of Sink and Eye Wash
4	Sink Detail

a. Omissions from the drawings/sketches or specifications or the mis-description of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or mis-described details of the work, but they shall be performed as if fully and correctly set forth and described in the drawings/sketches and specifications.

b. Notification of Discrepancies: The Contractor shall check all drawings/sketches furnished him immediately upon their receipt and shall promptly notify the Contracting Officer of any discrepancies. The Contractor shall compare all drawings/sketches and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby.

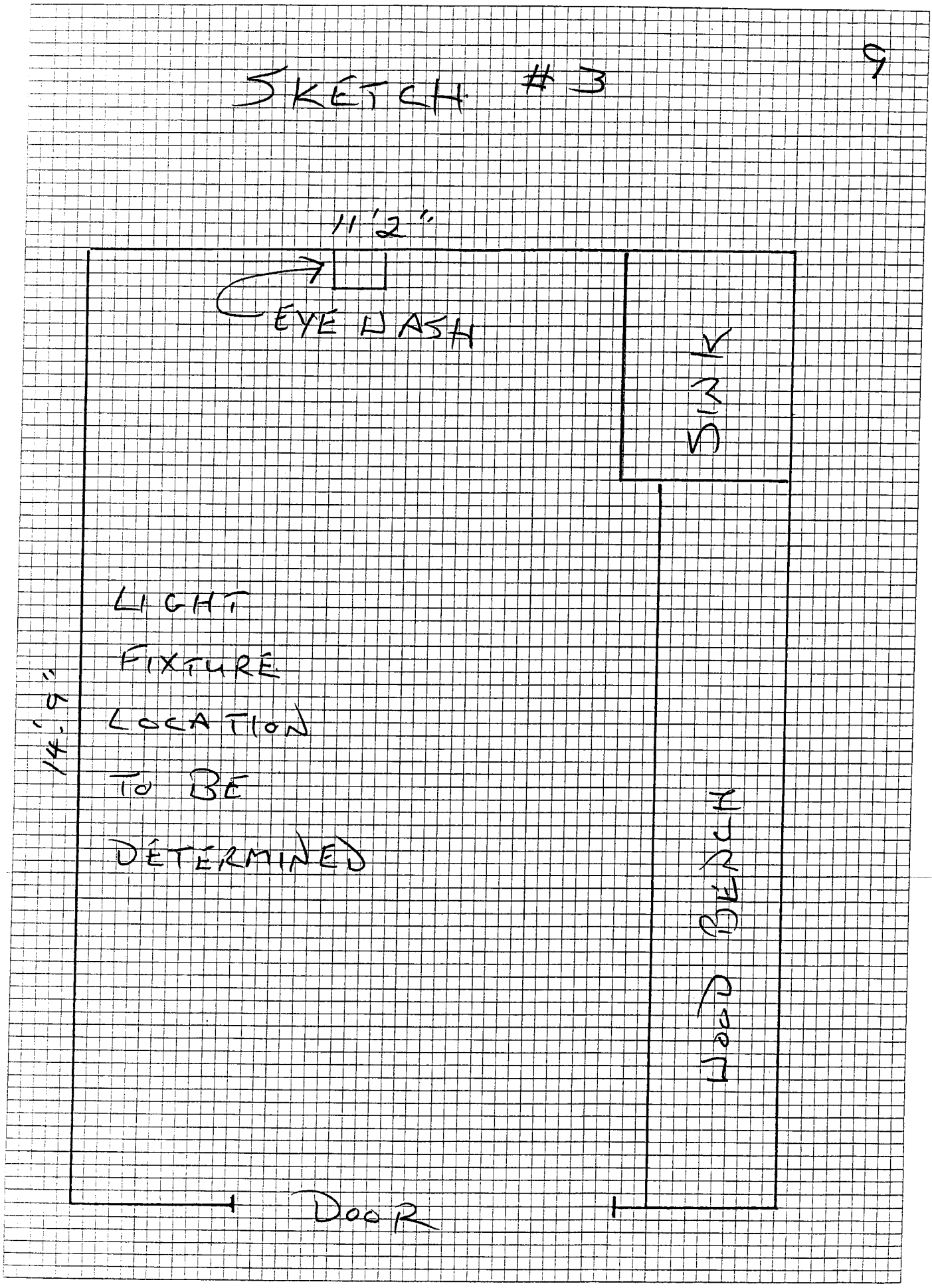


SKETCH #1

PLAN VIEW
N.T.S.

SKETCH #2

SKETCH #3


11'2"
EYE DASH
SINK
LIGHT
FIXTURE
LOCATION
TO BE
DETERMINED
14'-0"
DOOR
DOOR

Signature Series

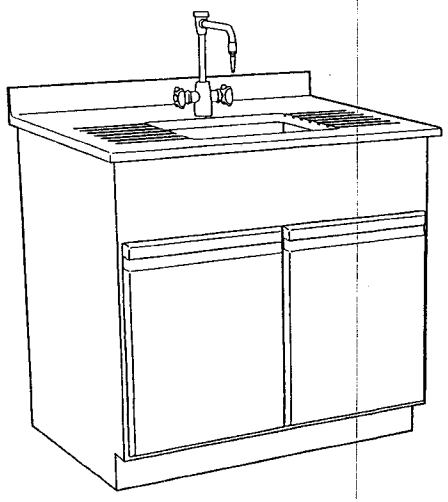
KEWAUNEE Scientific Corporation

Sink Assemblies

These Sink Assemblies are designed for wash-up and general laboratory use. Each is furnished with epoxy resin worksurfaces, curbs, ledges and sinks. Drain grooves are supplied in the drainboards as illustrated. Filler panels, base molding and molding corner clips are included to complete the sink assemblies.

Note: Last four digits of part number designates drawer head style, hinge, hardwood species and pull selection. See page 4 for full explanation. Actual product may vary slightly from catalog illustration due to style and hardware selection.

38" Wall Sink Assembly



T68H3638-____ 35¾" High x 31" Deep x 38" Long

Work Top:	1" Thick Black Kemresin with 4" High Curb and Drain Grooves
Work Top Size:	31" x 38"
Cabinets:	(1) G00H3636- Sink Cabinet
Sink:	(1) **1003-00** Kemresin Sink 11" H x 15" W x 18" L
	(1) **0482-BP** 1½" I.P.S. Sink Outlet
Fittings:	(1) **W-0340-0V** H & C Water w/VB Gooseneck

No service piping or electric conduit included.

Options:

T68H3638-F____ Without Fittings
T68H3638-T____ Without Work Top, Sink & Fittings

SKETCH # 4

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SECTION 00700 Contract Clauses

FAR 52.252-1--Solicitation Provisions Incorporated by Reference (Feb 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

http://farsite.hill.af.mil/

http://www.arnet.gov/far/

Clauses incorporated by reference (FAC 2005-36)

52.204-6	Data Universal Numbering System (DUNS) Number	Apr 2008
52.204-7	Central Contractor Registration	Apr 2008
52.211-18	Variation in Estimated Quantity	Apr 1984
52.213-4	Terms and Conditions—Simplified Acquisitions (Other Than Commercial Items)	Aug 2009
52.222-6	Davis Bacon Act	Jul 2005
52.222-7	Withholding of Funds	Feb 1988
52.222-8	Payrolls and Basic Records	Feb 1988
52.222-9	Apprentices and Trainees	Jul 2005
52.222-10	Compliance with Copeland Act Requirements	Feb 1988
52.222-11	Subcontracts (Labor Standards)	Jul 2005
52.222-12	Contract Termination-Debarment	Feb 1988
52.222-13	Compliance with Davis-Bacon and Related Act Regulations	Feb 1988
52.222-14	Disputes Concerning Labor Standards	Feb 1988
52.222-15	Certification of Eligibility	Feb 1988
52.222-23	Notice of Requirement For Affirmative Action to Ensure Equal Employment Opportunity for Construction	Feb 1999
52.222-27	Affirmative Action Compliance Requirements for Construction	Feb 1999
52.223-3	Hazardous Material Identification and Material Safety Data	Jan 1997
52.232-23	Assignment of Claims Alternate I	Jan 1986 Apr 1984
52.232-33	Payment by Electronic Funds Transfer Central Contractor Registration (31 U.S.C. 3332)	Oct. 2003
52.232-34	Payment by Electronic Funds Transfer Other Than Central Contractor Registration (31 U.S.C. 3332)	May 1999
52.232-36	Payment by Third Party (31 U.S.C. 3332)	May 1999
52.236-2	Differing Site Conditions	Apr 1984
52.236-3	Site Investigation and Conditions Affecting the Work	Apr 1984
52.236-5	Material and Workmanship	Apr 1984
52.236-6	Superintendence by the Contractor	Apr 1984
52.236-7	Permits and Responsibilities	Nov 1991
52.236-9	Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements	Apr 1984
52.236-12	Cleaning Up	Apr 1984
52.236-13	Accident Prevention	Nov 1991
52.236-17	Layout of Work	Apr 1984
52.242-14	Suspension of Work	Apr 1984
52.243-5	Changes and Changed Conditions	Apr 1984

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General Decision Number: GA080253 07/24/2009 GA253

State: Georgia

Construction Type: Building

County: Clarke County in Georgia.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Modification Number	Publication Date
0	11/07/2008
1	01/02/2009
2	03/06/2009
3	04/03/2009
4	05/01/2009
5	07/03/2009
6	07/24/2009

ASBE0048-001 04/01/2009

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR	$ 20.72	12.41

* CARP1263-001 07/01/2009

	Rates	Fringes
MILLWRIGHT	$ 22.42	11.95

ELEC0613-001 03/01/2009

	Rates	Fringes
ELECTRICIAN	$ 28.00	7.93

FOOTNOTES: Work on bar joists, walk logs, exposed steel and swinging scaffolds when the surface the worker stands or sits on exceeds twenty-five (25) feet above solid floor and the worker is subject to free fall: $1.00 per hour additional. Work of a similar nature above fifty (50) feet: $3.00 per hour additional.

ENGI0926-007 07/01/2009

	Rates	Fringes
Operating Engineers:		
Backhoe/Excavator and Hoist	$ 23.74	9.03
Bulldozer, Compactor, Drill, Forklift, Loader, and Scraper	$ 23.43	9.03
Crane and Boom	$ 27.38	9.03
Oiler	$ 20.21	9.03

FOOTNOTE: Paid Holidays - Labor Day and Christmas Day, if

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the worker has one year of continuous employment with the same contractor.

IRON0387-001 08/01/2008

	Rates	Fringes
IRONWORKER, STRUCTURAL	$ 24.04	9.26

PLUM0072-012 08/01/2008

	Rates	Fringes
PIPEFITTER, Including HVAC Pipe Installation	$ 28.80	10.51
PLUMBER (Excluding HVAC Pipe Installation)	$ 28.80	10.51

SHEE0085-001 08/01/2008

	Rates	Fringes
SHEET METAL WORKER, Including Hvac Duct Installation and Metal Roofing		
Buildings over 100,000 square feet	$ 28.00	11.11
Buildings up to 100,000 square feet	$ 22.40	10.95

FOOTNOTE: Work on swinging stages, boatswains chairs or scaffolds, booms, or scissors lifts over 50 ft. high: $1.25 per hour additional.

SUGA2008-165 08/21/2008

	Rates	Fringes
BRICKLAYER	$ 11.65	0.17
CARPENTER	$ 13.17	0.96
CEMENT MASON/CONCRETE FINISHER	$ 13.06	1.71
IRONWORKER, REINFORCING	$ 11.05	0.21
LABORER: Common or General	$ 9.00	0.29
LABORER: Pipelayer	$ 13.06	3.56
OPERATOR: Grader/Blade	$ 9.00	0.24
OPERATOR: Mechanic	$ 17.95	0.00
OPERATOR: Roller	$ 10.88	0.00
PAINTER: Brush, Roller and Spray	$ 13.43	0.00
ROOFER (Excluding Metal Roof)	$ 10.00	0.00

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TILE SETTER.....$ 15.00 0.00

TRUCK DRIVER.....$ 12.38 0.99

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in he matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

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Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

SECTION 01110 Summary of Work

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STATEMENT OF WORK

1. **LOCATION**: The work shall be located at Environmental Protection Agency, Athens, GA. The Contracting Officer's Representative will direct the contractor to the exact location.

2. **DESCRIPTION**: The work includes the following:

1. Extension of domestic water line from Environmental Chamber Building to Battery Shed through parking lot. Contractor shall saw cut asphalt, excavate utility trench 24" deep, install 3/4" Type K hard copper piping; backfill trench, compacting soil in 6" lifts, installing 6" gravel base for asphalt, and installing 2" asphalt cap. At tie-in with existing domestic water line, contractor shall install valve box and ball valve as cut-off for new line.

2. Installation of sewer line from Battery Shed to sewer manhole in lawn. Contractor shall core through floor and foundation and run 4" PVC DWV from sink and eye wash station to manhole in lawn. Contractor shall saw cut and patch side walk beside Shed. Contractor shall install two clean outs, one just outside building and another midway between the building and manhole. Contractor shall install waste stack up inside wall and through ceiling and roof. Contractor shall install escutcheon plate at ceiling and flashing on roof as specified and shall repair roof as necessary to keep water tight.

3. Installation of laboratory wall sink assembly similar to Kewaunee T68H3650, 35 3/4" H x 31" D x 50" Long with 1" thick black Kemresin work top with 4" high curb; cabinet: 1 each G00H3648; Kemresin sink # 1005-00, 10" H x 15" W x 25" L, 1 1/2" I.P.S. Sink Outlet, with goose neck faucet W-0340-0V, complete with P-trap and shut-offs.

4. Installation of wall mounted eyewash/face wash station complete with P-trap and shut-offs.

5. Installation of instantaneous, 6 GPM, hot water heater. Install wiring in rigid conduit and install circuit breaker in panel in support of hot water heater.

6. Installation of two surface mounted fluorescent light fixtures, 2 bulb, 4' fixtures with electronic ballasts and T-8 bulbs.

7. Remove wood benches on left wall and back wall. Shorten remaining bench to be flush against sink that sits in back right hand corner against inside wall.

8. Incidental related work.

3. **EXISTING WORK:** Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.

SECTION 01310 Administrative Requirements

1. PROTECTION AND CLEANUP: Upon completion of work each day, the Contractor shall remove all excess material and debris from the Government property, and leave the entire area in a neat and clean condition. Proper disposal of any materials and/or debris shall be the responsibility of the Contractor and all costs shall be incorporated in the contract price. No materials shall be disposed of on Government property.

2. STORM PROTECTION: Should warnings of wind of gale force or stronger be issued, the Contractor shall take every practicable precaution to minimize danger to persons, to the work, and to adjacent property. These precautions shall include closing all openings; removing all loose materials, tools and equipment from exposed locations; and securing scaffolding and other temporary work.

3. WORKING HOURS: The work shall be accomplished during normal working hours Monday through Friday, 8:00 AM to 4:30 PM unless special arrangements are made through the Contracting Officer's Representative to work outside of these hours or on weekends, excluding holidays. Request to work additional times should be submitted in writing to the Contracting Officer's Representative at least 5 days prior to requested work time.

4. PRE-CONSTRUCTION CONFERENCE: Before work commences Contractor must contact the Contracting Officer's Representative to schedule a pre-construction conference.

5. STATION REGULATIONS: Contractor must abide by all station regulations, including all security requirements, drug and alcohol abuse policies, and sexual harassment policies.

6. COMMENCEMENT OF WORK:

(a) The contractor shall notify the Contracting Officer's Representative at least three (3) working days prior to start of work.

(b) If applicable, Material Safety Data Sheets (MSDS) shall be submitted for government review and approval a minimum of ten (10) calendar days prior to commencement of use of any product deemed hazardous or toxic by OSHA or the Environmental Protection Agency.

7. TIME FOR COMPLETION: The work shall be completed and ready for use no later than the date specified on the purchase order. Time for completion includes mailing time for all correspondence, submission of submittals and bonds (if applicable), pre-construction conference, weather, clean up and all items mentioned herein.

8. SAFETY: Safety will be enforced as per the latest edition of 29 CFR 1910 and 29 CFR 1926.

9. MINIMUM WAGE RATES: The minimum wages required to be paid for work specified herein are incorporated by the attached wage determination hererto and made a part of this specification.

10. INVOICING PROCEDURES

10.1 One original copy of the Contractor's invoice with one signed original of Certification shall be submitted to the Contracting Officer when work has been performed. Upon verification of work actually performed and receipt of required submittals, invoices will be processed for payment. Invoices shall include invoice number and date, name of contractor, contract number, contract title, mailing address, and phone number of person to be notified in the event of improper invoice, and any other information agreed upon during the pre-construction conference.

10.4 Invoices, certifications, and final releases may be emailed to pittman.rick@epa.gov, faxed to 706.355.8026 to the attention of Rick Pittman, or mailed to Environmental Protection Agency, Attn: Rick Pittman, 960 College Station Road, Athens, GA 30605.

11. PAYROLLS: In accordance with FAR 52.222-8, Payrolls and Basic Records, a copy of payrolls for each employee shall be submitted to the Contracting Officer weekly. If certified payrolls are not received weekly or at all, invoice may be returned unprocessed. However, prior to final invoice, all certified payrolls must be submitted and approved, before final payment will be made.

12. REQUIRED INSURANCE: The Contractor shall procure, maintain, and provide proof of insurance to the Contracting Officer. If Contractor does not submit certificate of insurance, the Contractor shall certify with request for payment that insurance is current and in accordance with State Law. Insurance shall be required as by State Law. If Contractor decides to submit insurance certificate, the certificate must have the following minimum insurance coverage:

a. Comprehensive general liability: $500,000 per occurrence
b. Automobile liability: $200,000 per person, $500,000 per occurrence, $20,000 per occurrence for property damage

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c. Workmen's compensation: As required by Federal and State worker's compensation and occupational disease laws
d. Employer's liability coverage: $100,000 except in States where worker's compensation may not be written by private carriers.
e. Others as required by State law.

12.1 Prior to commencement of work, the Contractor shall furnish to the Contracting Officer a certificate or written statement of the above required insurance.

12.2 Certificate holder shall be listed as follows: Environmental Protection Agency, 960 College Station Road, Athens, GA 30605.

12.3 Cancellation paragraph shall read as follows: "Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will mail 30 days written notice to the certificate holder named to the left."

12.4 The Description block must state the contract number and title of the project.

12.5 Insurance certificate must be submitted prior to commencing work on Government property.

12.6 No work shall be performed until the insurance document is approved by the Contracting Officer. Additional time for late submission of insurance document will not be authorized.

13. SECURITY REQUIREMENTS: A list of contractor and subcontractor employees must be submitted prior to work, listing each employee's name, address, and social security number. The Security Department is responsible for issuing employee badges and car passes.

14. CONTRACTING OFFICER AUTHORITY: In no event shall any understanding or agreement between the Contractor and any Government employee other than the Contracting Officer on any contract, modification, change order, letter or verbal direction to the Contractor be effective or binding upon the Government. All such actions must be formalized by a proper contractual document executed by an appointed Contracting Officer. The Contractor is hereby put on notice that in the event a Government employee other than the Contracting Officer directs a change in the work to be performed or increases the scope of the work to be performed, it is the Contractor's responsibility to make inquiry of the Contracting Officer before making the deviation. Payments will not be made without being authorized by an appointed Contracting Officer with the legal authority to bind the Government.

15. GOVERNMENT REPRESENTATIVES: The contract will be administered by an authorized representative of the Contracting Officer. In no event, however, will any understanding or agreement, modification, change order, or other matter deviating from the terms of the contract between the contractor and any person other than the Contracting Officer be effective or binding upon the Government, unless formalized by proper contractual documents executed by the Contracting Officer prior to completion of this contract. The authorized representative as indicated hereinafter:

a. The Contracting Officer's Representative (COR) will be designated by the Contracting Officer as the authorized representative of the Contracting Officer. The COR is responsible for monitoring performance and the technical management of the effort required hereunder, and should be contacted regarding questions or problems of a technical nature.

b. The designated Contract Specialist will be the Administrative Contracting Officer's representative on all other contract administrative matters. The Contract Specialist should be contacted regarding all matters pertaining to the contract or task/delivery orders.

16. AVAILABILITY OF UTILITIES: When available, the Government will furnish reasonable amounts of the following utilities for the work to be performed under this contract at no cost to the contractor. Information concerning the location of existing outlets may be secured from the OIC. The contractor shall provide and maintain, at his expense, the necessary service lines from existing Government outlets to the site of work.

Electricity and Water

16.1 Contractor Furnished Utilities: In the event that the Government is unable to provide the required types of utilities, the contractor shall, at his expense, arrange for the required utilities.

16.2 Contractor Energy Conservation: The contractor shall be directly responsible for instructing employees in utilities conservation practices. The contractor shall be responsible for operating under conditions which preclude the waste of utilities, which shall include:

a. Lights shall be used only in areas where and at the time when work is actually being performed.

b. Mechanical equipment controls for heating, ventilation and air conditioning systems will not be adjusted by the workers.

c. Water faucets or valves shall be turned off after the required usage has been accomplished.

16.3 Telephone Lines: Telephone lines for the sole use of the contractor will not be available. Government telephones shall not be used for personal reasons.

16.4 Contractor Availability: The contractor shall maintain a telephone at which he or his representative may be reached 24 hours daily.

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SECTION 01 11 00

SUMMARY OF WORK
01/08

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

The work includes the following:

1. Extension of domestic water line from Environmental Chamber Building to Battery Shed through parking lot. Contractor shall saw cut asphalt, excavate utility trench 24" deep, install 3/4" Type K hard copper piping; backfill trench, compacting soil in 6" lifts, installing 6" gravel base for asphalt, and installing 2" asphalt cap. At tie-in with existing domestic water line, contractor shall install valve box and ball valve as cut-off for new line.

2. Installation of sewer line from Battery Shed to sewer manhole in lawn. Contractor shall core through floor and foundation and run 4" PVC DWV from sink and eye wash station to manhole in lawn. Contractor shall saw cut and patch side walk beside Shed. Contractor shall install two clean outs, one just outside building and another midway between the building and manhole. Contractor shall install waste stack up inside wall and through ceiling and roof. Contractor shall install escutcheon plate at ceiling and flashing on roof as specified and shall repair roof as necessary to keep water tight.

3. Installation of laboratory wall sink assembly similar to Kewaunee T68H3650, 35 3/4" H x 31" D x 50" Long with 1" thick black Kemresin work top with 4" high curb; cabinet: 1 each G00H3648; Kemresin sink # 1005-00, 10" H x 15" W x 25" L, 1 1/2" I.P.S. Sink Outlet, with goose neck faucet W-0340-0V, complete with P-trap and shut-offs.

4. Installation of wall mounted eyewash/face wash station complete with P-trap and shut-offs.

5. Installation of instantaneous, 6 GPM, hot water heater. Install wiring in rigid conduit and install circuit breaker in panel in support of hot water heater.

6. Installation of two surface mounted fluorescent light fixtures, 2 bulb, 4' fixtures with electronic ballasts and T-8 bulbs.

7. Remove wood benches on left wall and back wall. Shorten remaining bench to be flush against sink that sits in back right hand corner against inside wall.

8. Incidental related work.

1.1.2 Location

The work shall be located at the EPA, Field Researh Annex, 625 Bailey Road, Athens, GA, approximately as indicated. The exact location will be shown by the Contracting Officer.

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1.2 OCCUPANCY OF PREMISES

Building will not be occupied during performance of work under this Contract.

Before work is started, the Contractor shall arrange with the Contracting Officer a sequence of procedure, means of access, space for storage of materials and equipment, and use of approaches, corridors, and stairways.

1.3 EXISTING WORK

In addition to "FAR 52.236-9, Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements":

a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.

b. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

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SECTION 07 92 00

JOINT SEALANTS
01/07

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C 1311	(2002) Standard Specification for Solvent Release Agents
ASTM C 509	(2006) Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM C 920	(2008) Standard Specification for Elastomeric Joint Sealants
ASTM D 1056	(2007) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

1.2 SUBMITTALS

Submit the following:

SD-03 Product Data

Sealants

Primers

Bond breakers

Backstops

Manufacturer's descriptive data including storage requirements, shelf life, curing time, instructions for mixing and application, and primer data (if required). Provide a copy of the Material Safety Data Sheet for each solvent, primer or sealant material.

1.3 ENVIRONMENTAL CONDITIONS

Apply sealant when the ambient temperature is between 40 and 90 degrees F.

PART 2 PRODUCTS

2.1 SEALANTS

Provide sealant that has been tested and found suitable for the substrates to which it will be applied.

2.1.1 Interior Sealant

Provide ASTM C 920, Type S or M, Grade NS, Class 12.5, Use NT. Location(s) and color(s) of sealant for the following:

	LOCATION	COLOR
a.	Small voids between walls or partitions and adjacent lockers, casework, shelving, door frames, built-in or surface-mounted equipment and fixtures, and similar items.	As selected
b.	Interior locations, not otherwise indicated or specified, where small voids exist between materials specified to be painted.	As selected
c.	As specified	As selected

2.1.2 Exterior Sealant

For joints in vertical surfaces, provide ASTM C 920, Type S or M, Grade NS, Class 25, Use NT. For joints in horizontal surfaces, provide ASTM C 920, Type S or M, Grade P, Class 25, Use T. Provide location(s) and color(s) of sealant as follows:

	LOCATION	COLOR
a.	Voids where items pass through exterior walls.	Match adjacent surface color
b.	As specified	As selected

2.2 PRIMERS

Provide a nonstaining, quick-drying type and consistency recommended by the sealant manufacturer for the particular application.

2.3 BOND BREAKERS

Provide the type and consistency recommended by the sealant manufacturer to prevent adhesion of the sealant to backing or to bottom of the joint.

2.4 BACKSTOPS

Provide glass fiber roving or neoprene, butyl, polyurethane, or polyethylene foams free from oil or other staining elements as recommended by sealant manufacturer. Provide 25 to 33 percent oversized backing for closed cell and 40 to 50 percent oversized backing for open cell material, unless otherwise indicated. Make backstop material compatible with sealant.

2.4.1 Rubber

Conform to ASTM D 1056, Type 2, closed cell, Class A, round cellular rubber sponge backing.

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2.4.2 Synthetic Rubber

Conform to ASTM C 509, Option I, Type I preformed rods or tubes for Synthetic rubber backing.

2.4.3 Neoprene

Conform to ASTM D 1056, closed cell expanded neoprene cord Type 2, Class C, Grade 2C2 for Neoprene backing.

2.4.4 Butyl Rubber Based

Provide Butyl Rubber Based Sealants of single component, solvent release, color as selected, conforming to ASTM C 1311.

2.5 CLEANING SOLVENTS

Provide type(s) recommended by the sealant manufacturer.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Clean surfaces from dirt frost, moisture, grease, oil, wax, lacquer, paint, or other foreign matter that would tend to destroy or impair adhesion. Remove oil and grease with solvent. Surfaces must be wiped dry with clean cloths. When resealing an existing joint, remove existing caulk or sealant prior to applying new sealant. For surface types not listed below, contact sealant manufacturer for specific recommendations.

3.1.1 Steel Surfaces

Remove loose mill scale by sandblasting or, if sandblasting is impractical or would damage finish work, scraping and wire brushing. Remove protective coatings by sandblasting or using a residue-free solvent.

3.1.2 Concrete and Masonry Surfaces

Where surfaces have been treated with curing compounds, oil, or other such materials, remove materials by sandblasting or wire brushing. Remove laitance, efflorescence and loose mortar from the joint cavity.

3.1.3 Wood Surfaces

Keep wood surfaces to be in contact with sealants free of splinters and sawdust or other loose particles.

3.2 SEALANT PREPARATION

Do not add liquids, solvents, or powders to the sealant. Mix multicomponent elastomeric sealants in accordance with manufacturer's instructions.

3.3 APPLICATION

3.3.1 Joint Width-To-Depth Ratios

a. Acceptable Ratios:

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JOINT WIDTH	JOINT DEPTH Minimum	Maximum
For metal, glass, or other nonporous surfaces:		
1/4 inch (minimum)	1/4 inch	1/4 inch
over 1/4 inch	1/2 of width	Equal to width
For wood, concrete, masonry, stone:		
1/4 inch (minimum)	1/4 inch	1/4 inch
Over 1/4 inch to 1/2 inch	1/4 inch	Equal to width
Over 1/2 inch to 2 inch	1/2 inch	5/8 inch
Over 2 inch.	(As recommended by sealant manufacturer)	

b. Unacceptable Ratios: Where joints of acceptable width-to-depth ratios have not been provided, clean out joints to acceptable depths and grind or cut to acceptable widths without damage to the adjoining work. Grinding is not required on metal surfaces.

3.3.2 Masking Tape

Place masking tape on the finish surface on one or both sides of a joint cavity to protect adjacent finish surfaces from primer or sealant smears. Remove masking tape within 10 minutes after joint has been filled and tooled.

3.3.3 Backstops

Install backstops dry and free of tears or holes. Tightly pack the back or bottom of joint cavities with backstop material to provide a joint of the depth specified. Install backstops in the following locations:

a. Where indicated.

b. Where backstop is not indicated but joint cavities exceed the acceptable maximum depths specified in paragraph entitled, "Joint Width-to-Depth Ratios".

3.3.4 Primer

Immediately prior to application of the sealant, clean out loose particles from joints. Where recommended by sealant manufacturer, apply primer to joints in concrete masonry units, wood, and other porous surfaces in accordance with sealant manufacturer's instructions. Do not apply primer to exposed finish surfaces.

3.3.5 Bond Breaker

Provide bond breakers to the back or bottom of joint cavities, as recommended by the sealant manufacturer for each type of joint and sealant used, to prevent sealant from adhering to these surfaces. Carefully apply

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the bond breaker to avoid contamination of adjoining surfaces or breaking bond with surfaces other than those covered by the bond breaker.

3.3.6 Sealants

Provide a sealant compatible with the material(s) to which it is applied. Do not use a sealant that has exceeded shelf life or has jelled and can not be discharged in a continuous flow from the gun. Apply the sealant in accordance with the manufacturer's printed instructions with a gun having a nozzle that fits the joint width. Force sealant into joints to fill the joints solidly without air pockets. Tool sealant after application to ensure adhesion. Make sealant uniformly smooth and free of wrinkles. Upon completion of sealant application, roughen partially filled or unfilled joints, apply sealant, and tool smooth as specified. Apply sealer over the sealant when and as specified by the sealant manufacturer.

3.4 PROTECTION AND CLEANING

3.4.1 Protection

Protect areas adjacent to joints from sealant smears. Masking tape may be used for this purpose if removed 5 to 10 minutes after the joint is filled.

3.4.2 Final Cleaning

Upon completion of sealant application, remove remaining smears and stains and leave the work in a clean and neat condition.

a. Masonry and Other Porous Surfaces: Immediately scrape off fresh sealant that has been smeared on masonry and rub clean with a solvent as recommended by the sealant manufacturer. Allow excess sealant to cure for 24 hour then remove by wire brushing or sanding.

b. Metal and Other Non-Porous Surfaces: Remove excess sealant with a solvent-moistened cloth.

-- End of Section --

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SECTION 22 00 00

PLUMBING, GENERAL PURPOSE
02/09

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 90.1 - IP	(2007; Supplement 2008; Errata 2009; Errata 2009) Energy Standard for Buildings Except Low-Rise Residential Buildings, I-P Edition

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE 1010	(2004) Water Hammer Arresters

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA 10084	(2005) Standard Methods for the Examination of Water and Wastewater
AWWA C651	(2005; Errata 2005) Standard for Disinfecting Water Mains
AWWA C652	(2002) Disinfection of Water-Storage Facilities

ASME INTERNATIONAL (ASME)

ASME A112.36.2M	(1991; R 2008) Cleanouts
ASME A112.6.1M	(1997; R 2008) Floor Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use
ASME B16.18	(2001; R 2005) Cast Copper Alloy Solder Joint Pressure Fittings
ASME B16.22	(2001; R 2005) Standard for Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
ASME B31.5	(2006) Refrigeration Piping and Heat Transfer Components

ASTM INTERNATIONAL (ASTM)

ASTM B 32	(2008) Standard Specification for Solder Metal

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ASTM B 813	(2000; R 2009) Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube
ASTM B 88	(2003) Standard Specification for Seamless Copper Water Tube
ASTM B 88M	(2005) Standard Specification for Seamless Copper Water Tube (Metric)
ASTM C 920	(2008) Standard Specification for Elastomeric Joint Sealants
ASTM D 2564	(2004e1) Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems
ASTM D 2665	(2009) Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM D 2822	(2005) Asphalt Roof Cement
ASTM D 2855	(1996; R 2002) Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings
ASTM F 1760	(2001; R 2005e1) Coextruded Poly(Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed-Recycled Content
ASTM F 891	(2007) Coextruded Poly (Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core

COPPER DEVELOPMENT ASSOCIATION (CDA)

CDA A4015	(1994; R 1995) Copper Tube Handbook

INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS (IAPMO)

IAPMO PS 117	(2005) Press Type Or Plain End Rub Gsktd W/ Nail CU & CU Alloy Fittings for Install On CU Tubing

INTERNATIONAL CODE COUNCIL (ICC)

ICC IPC	(2006; Supplement 2007) International Plumbing Code

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ISEA Z358.1	(2004) Emergency Eyewash and Shower Equipment

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MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-110	(1996) Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends
MSS SP-58	(2002) Standard for Pipe Hangers and Supports - Materials, Design and Manufacture
MSS SP-69	(2003; R 2004) Standard for Pipe Hangers and Supports - Selection and Application

PLASTIC PIPE AND FITTINGS ASSOCIATION (PPFA)

PPFA-01	(1998) Plastic Pipe in Fire Resistive Construction

PLUMBING AND DRAINAGE INSTITUTE (PDI)

PDI WH 201	(2006) Water Hammer Arresters Standard

SOCIETY OF AUTOMOTIVE ENGINEERS INTERNATIONAL (SAE)

SAE J1508	(2009) Hose Clamp Specifications

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

PL 109-58	Energy Policy Act of 2005 (EPAct05)

UNDERWRITERS LABORATORIES (UL)

UL 499	(2005; Rev thru Aug 2008) Electric Heating Appliances

1.2 SUBMITTALS

The following shall be submitted:

Laboratory sink

Eye wash station

Water heater

1.3 STANDARD PRODUCTS

Specified materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacture of such products. Specified equipment shall essentially duplicate equipment that has performed satisfactorily at least two years prior to bid opening. Standard products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year use shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2 year period.

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1.4 REGULATORY REQUIREMENTS

Unless otherwise required herein, plumbing work shall be in accordance with ICC IPC. Energy consuming products and systems shall be in accordance with PL 109-58 and ASHRAE 90.1 - IP

1.5 PROJECT/SITE CONDITIONS

The Contractor shall become familiar with details of the work, verify dimensions in the field, and advise the Contracting Officer of any discrepancy before performing any work.

PART 2 PRODUCTS

2.1 MATERIALS

Materials for various services shall be in accordance with TABLES I and II.

2.1.1 Pipe Joint Materials

Joints and gasket materials shall conform to the following:

a. Solder Material: Solder metal shall conform to ASTM B 32.

b. Solder Flux: Flux shall be liquid form, non-corrosive, and conform to ASTM B 813, Standard Test 1.

c. PTFE Tape: PTFE Tape, for use with Threaded Metal or Plastic Pipe.

e. Plastic Solvent Cement for PVC Plastic Pipe: ASTM D 2564 and ASTM D 2855.

f. Press fittings for Copper Pipe and Tube: Copper press fittings shall conform to the material and sizing requirements of ASME B16.18 or ASME B16.22 and performance criteria of IAPMO PS 117. Sealing elements for copper press fittings shall be EPDM, FKM or HNBR. Sealing elements shall be factory installed or an alternative supplied fitting manufacturer. Sealing element shall be selected based on manufacturer's approved application guidelines.

u. Copper tubing shall conform to ASTM B 88, Type K.

2.1.2 Miscellaneous Materials

Miscellaneous materials shall conform to the following:

a. Asphalt Roof Cement: ASTM D 2822.

b. Hose Clamps: SAE J1508.

c. Supports for Off-The-Floor Plumbing Fixtures: ASME A112.6.1M.

d. Metallic Cleanouts: ASME A112.36.2M.

e. Water Hammer Arrester: PDI WH 201. Water hammer arrester shall be diaphragm or piston type.

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2.2 PIPE HANGERS, INSERTS, AND SUPPORTS

Pipe hangers, inserts, and supports shall conform to MSS SP-58 and MSS SP-69.

2.3 VALVES

Valves shall be provided on supplies to equipment and fixtures. Valves 2-1/2 inches and smaller shall be bronze with threaded bodies for pipe and solder-type connections for tubing. Valves shall conform to the following standards:

Description	Standard
Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends	MSS SP-110

2.4 FIXTURES

Fixtures shall be water conservation type, in accordance with ICC IPC.

2.4.1 Emergency Eye and Face Wash

ISEA Z358.1, wall-mounted self-cleaning, nonclogging eye and face wash with quick opening, full-flow valves, stainless steel eye and face wash receptor. Unit shall deliver 3 gpm of aerated water at 30 psig flow pressure, with eye and face wash nozzles 33 to 45 inches above finished floor. Provide copper alloy control valves. Provide an air-gap with the lowest potable eye and face wash water outlet located above the overflow rim by not less than the International Plumbing Code minimum.

2.5 WATER HEATERS

Water heater types and capacities shall be as indicated.

2.5.1 Electric Instantaneous Water Heaters (Tankless)

UL 499 and UL listed flow switch activated, tankless electric instantaneous water heater for wall mounting below sink or lavatory.

2.6 ELECTRICAL WORK

Power wiring and conduit for field installed equipment shall be provided under and conform to the requirements of Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

2.7 MISCELLANEOUS PIPING ITEMS

2.7.1 Escutcheon Plates

Provide one piece or split hinge metal plates for piping entering floors, walls, and ceilings in exposed spaces. Provide chromium-plated on copper alloy plates or polished stainless steel finish in finished spaces. Provide paint finish on plates in unfinished spaces.

2.7.2 Pipe Sleeves

Provide where piping passes entirely through walls, ceilings, roofs, and

floors. Sleeves are not required where drain, waste, and vent (DWV) piping passes through concrete floor slabs located on grade, except where penetrating a membrane waterproof floor.

2.7.2.1 Sleeves in Masonry and Concrete

Provide steel pipe sleeves or schedule 40 PVC plastic pipe sleeves. Sleeves are not required where drain, waste, and vent (DWV) piping passes through concrete floor slabs located on grade. Core drilling of masonry and concrete may be provided in lieu of pipe sleeves when cavities in the core-drilled hole are completely grouted smooth.

2.7.2.2 Sleeves Not in Masonry and Concrete

Provide 26 gage galvanized steel sheet or PVC plastic pipe sleeves.

2.7.3 Pipe Hangers (Supports)

Provide MSS SP-58 and MSS SP-69, Type 1 with adjustable type steel support rods, except as specified or indicated otherwise. Attach to steel joists with Type 19 or 23 clamps and retaining straps. Attach to Steel W or S beams with Type 21, 28, 29, or 30 clamps. Attach to steel angles and vertical web steel channels with Type 20 clamp with beam clamp channel adapter. Attach to horizontal web steel channel and wood with drilled hole on centerline and double nut and washer. Attach to concrete with Type 18 insert or drilled expansion anchor. Provide Type 40 insulation protection shield for insulated piping.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Installation of plastic pipe where in compliance with NFPA may be installed in accordance with PPFA-01. The plumbing system shall be installed complete with necessary fixtures, fittings, traps, valves, and accessories. A ball valve and drain shall be installed on the water service line inside the building approximately 6 inches above the floor from point of entry. Piping shall be connected to the exterior service lines or capped or plugged if the exterior service is not in place. Sewer and water pipes shall be laid in separate trenches, except when otherwise shown. Exterior underground utilities shall be at least 12 inches below the finish grade or as indicated on the drawings. If trenches are closed or the pipes are otherwise covered before being connected to the service lines, the location of the end of each plumbing utility shall be marked with a stake or other acceptable means. Valves shall be installed with control no lower than the valve body.

3.1.1 Water Pipe, Fittings, and Connections

3.1.1.1 Utilities

The piping shall be extended to fixtures, outlets, and equipment. The hot-water and cold-water piping system shall be arranged and installed to permit draining. The supply line to each item of equipment or fixture, except faucets, flush valves, or other control valves which are supplied with integral stops, shall be equipped with a shutoff valve to enable isolation of the item for repair and maintenance without interfering with operation of other equipment or fixtures. Supply piping to fixtures, faucets, hydrants, shower heads, and flushing devices shall be anchored to

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prevent movement.

3.1.1.2 Cutting and Repairing

The work shall be carefully laid out in advance, and unnecessary cutting of construction shall be avoided. Damage to building, piping, wiring, or equipment as a result of cutting shall be repaired by mechanics skilled in the trade involved.

3.1.1.3 Protection of Fixtures, Materials, and Equipment

Pipe openings shall be closed with caps or plugs during installation. Fixtures and equipment shall be tightly covered and protected against dirt, water, chemicals, and mechanical injury. Upon completion of the work, the fixtures, materials, and equipment shall be thoroughly cleaned, adjusted, and operated. Safety guards shall be provided for exposed rotating equipment.

3.1.1.4 Mains, Branches, and Runouts

Pipe shall be accurately cut and worked into place without springing or forcing. Structural portions of the building shall not be weakened. Aboveground piping shall run parallel with the lines of the building, unless otherwise indicated. Branch pipes from service lines may be taken from top, bottom, or side of main, using crossover fittings required by structural or installation conditions. Supply pipes, valves, and fittings shall be kept a sufficient distance from other work and other services to permit not less than 1/2 inch between finished covering on the different services. Bare and insulated water lines shall not bear directly against building structural elements so as to transmit sound to the structure or to prevent flexible movement of the lines. Changes in pipe sizes shall be made with reducing fittings. Use of bushings will not be permitted except for use in situations in which standard factory fabricated components are furnished to accommodate specific accepted installation practice. Change in direction shall be made with fittings, except that bending of pipe 4 inches and smaller will be permitted, provided a pipe bender is used and wide sweep bends are formed. The center-line radius of bends shall be not less than six diameters of the pipe. Bent pipe showing kinks, wrinkles, flattening, or other malformations will not be acceptable.

3.1.1.5 Commercial-Type Water Hammer Arresters

Commercial-type water hammer arresters shall be provided on hot- and cold-water supplies, with precise location and sizing to be in accordance with PDI WH 201. Water hammer arresters, where concealed, shall be accessible by means of access doors or removable panels. Commercial-type water hammer arresters shall conform to ASSE 1010. Vertical capped pipe columns will not be permitted.

3.1.2 Joints

Installation of pipe and fittings shall be made in accordance with the manufacturer's recommendations. Mitering of joints for elbows and notching of straight runs of pipe for tees will not be permitted. Joints shall be made up with fittings of compatible material and made for the specific purpose intended.

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3.1.2.1 Copper Tube and Pipe

a. Soldered. Soldered joints shall be made with flux and are only acceptable for piping 2 inches and smaller. Soldered joints shall conform to ASME B31.5 and CDA A4015. Soldered joints shall not be used in compressed air piping between the air compressor and the receiver.

b. Copper Tube Extracted Joint. Mechanically extracted joints shall be made in accordance with ICC IPC.

c. Press connection. Copper press connections shall be made in **strict** accordance with the manufacturer's installation instructions for manufactured rated size. The joints shall be pressed using the tool(s) approved by the manufacturer **of that joint**. Minimum distance between fittings shall be in accordance with the manufacturer's requirements.

3.1.2.2 Plastic Pipe

PVC pipe shall have joints made with solvent cement elastomeric, threading, (threading of Schedule 80 Pipe is allowed only where required for disconnection and inspection; threading of Schedule 40 Pipe is not allowed), or mated flanged.

3.1.3 Pipe Sleeves and Flashing

Pipe sleeves shall be furnished and set in their proper and permanent location.

3.1.3.1 Sleeve Requirements

Unless indicated otherwise, provide pipe sleeves meeting the following requirements:

Secure sleeves in position and location during construction. Provide sleeves of sufficient length to pass through entire thickness of walls, ceilings, roofs, and floors.

A modular mechanical type sealing assembly may be installed in lieu of a waterproofing clamping flange and caulking and sealing of annular space between pipe and sleeve. The seals shall consist of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and sleeve using galvanized steel bolts, nuts, and pressure plates. The links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and each nut. After the seal assembly is properly positioned in the sleeve, tightening of the bolt shall cause the rubber sealing elements to expand and provide a watertight seal between the pipe and the sleeve. Each seal assembly shall be sized as recommended by the manufacturer to fit the pipe and sleeve involved.

Sleeves shall not be installed in structural members, except where indicated or approved. Rectangular and square openings shall be as detailed. Each sleeve shall extend through its respective floor, or roof, and shall be cut flush with each surface, except for special circumstances. Pipe sleeves passing through floors in wet areas such as mechanical equipment rooms, lavatories, kitchens, and other plumbing fixture areas shall extend a minimum of 4 inches above the finished floor.

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Unless otherwise indicated, sleeves shall be of a size to provide a minimum of 1/4 inch clearance between bare pipe or insulation and inside of sleeve or between insulation and inside of sleeve. Sleeves in bearing walls and concrete slab on grade floors shall be steel pipe or cast-iron pipe. Sleeves in nonbearing walls or ceilings may be steel pipe, cast-iron pipe, galvanized sheet metal with lock-type longitudinal seam, or plastic.

Except as otherwise specified, the annular space between pipe and sleeve, or between jacket over insulation and sleeve, shall be sealed as indicated with sealants conforming to ASTM C 920 and with a primer, backstop material and surface preparation as specified in Section 07 92 00 JOINT SEALANTS. The annular space between pipe and sleeve, between bare insulation and sleeve or between jacket over insulation and sleeve shall not be sealed for interior walls which are not designated as fire rated.

Sleeves through below-grade walls in contact with earth shall be recessed 1/2 inch from wall surfaces on both sides. Annular space between pipe and sleeve shall be filled with backing material and sealants in the joint between the pipe and concrete wall as specified above. Sealant selected for the earth side of the wall shall be compatible with dampproofing/waterproofing materials that are to be applied over the joint sealant.

3.1.3.2 Flashing Requirements

Pipes passing through roof shall be installed through a 16 ounce copper flashing, each within an integral skirt or flange. Flashing shall be suitably formed, and the skirt or flange shall extend not less than 8 inches from the pipe and shall be set over the roof or floor membrane in a solid coating of bituminous cement. The flashing shall extend up the pipe a minimum of 10 inches. For cleanouts, the flashing shall be turned down into the hub and caulked after placing the ferrule. Pipes passing through pitched roofs shall be flashed, using lead or copper flashing, with an adjustable integral flange of adequate size to extend not less than 8 inches from the pipe in all directions and lapped into the roofing to provide a watertight seal. The annular space between the flashing and the bare pipe or between the flashing and the metal-jacket-covered insulation shall be sealed as indicated. Flashing for dry vents shall be turned down into the pipe to form a waterproof joint. Pipes, up to and including 10 inches in diameter, passing through roof or floor waterproofing membrane may be installed through a cast-iron sleeve with caulking recess, anchor lugs, flashing-clamp device, and pressure ring with brass bolts. Flashing shield shall be fitted into the sleeve clamping device. Pipes passing through wall waterproofing membrane shall be sleeved as described above. A waterproofing clamping flange shall be installed.

3.1.3.3 Optional Counterflashing

Instead of turning the flashing down into a dry vent pipe, or caulking and sealing the annular space between the pipe and flashing or metal-jacket-covered insulation and flashing, counterflashing may be accomplished by utilizing the following:

a. A standard roof coupling for threaded pipe up to 6 inches in diameter.

b. A tack-welded or banded-metal rain shield around the pipe.

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3.1.3.4 Pipe Penetrations of Slab on Grade Floors

Where pipes, fixture drains, floor drains, cleanouts or similar items penetrate slab on grade floors, except at penetrations of floors with waterproofing membrane as specified in paragraphs Flashing Requirements and Waterproofing, a groove 1/4 to 1/2 inch wide by 1/4 to 3/8 inch deep shall be formed around the pipe, fitting or drain. The groove shall be filled with a sealant as specified in Section 07 92 00 JOINT SEALANTS.

3.1.3.5 Pipe Penetrations

Provide sealants for all pipe penetrations. All pipe penetrations shall be sealed to prevent infiltration of air, insects, and vermin.

3.1.4 Pipe Cleanouts

Pipe cleanouts shall be the same size as the pipe except that cleanout plugs larger than 4 inches will not be required. Cleanouts shall be T-pattern, 90-degree branch drainage fittings with cast-brass screw plugs, except plastic plugs shall be installed in plastic pipe. Plugs shall be the same size as the pipe up to and including 4 inches. Cleanout tee branches with screw plug shall be installed at the foot of soil and waste stacks and on each building drain outside the building. Cleanout tee branches may be omitted on stacks in single story buildings with slab-on-grade construction or where less than 18 inches of crawl space is provided under the floor. Cleanouts on pipe concealed in partitions shall be provided with chromium plated bronze, nickel bronze, nickel brass or stainless steel flush type access cover plates. Round access covers shall be provided and secured to plugs with securing screw. Square access covers may be provided with matching frames, anchoring lugs and cover screws. Where cleanouts are provided with adjustable heads, the heads shall be plastic.

3.2 FIXTURES AND FIXTURE TRIMMINGS

Polished chromium-plated pipe, valves, and fittings shall be provided where exposed to view. Angle stops, straight stops, stops integral with the faucets, or concealed type of lock-shield, and loose-key pattern stops for supplies with threaded, sweat or solvent weld inlets shall be furnished and installed with fixtures.

3.2.1 Fixture Connections

Where space limitations prohibit standard fittings in conjunction with the cast-iron floor flange, special short-radius fittings shall be provided. Connections between earthenware fixtures and flanges on soil pipe shall be made gastight and watertight with a closet-setting compound or neoprene gasket and seal. Use of natural rubber gaskets or putty will not be permitted. Fixtures with outlet flanges shall be set the proper distance from floor or wall to make a first-class joint with the closet-setting compound or gasket and fixture used.

3.3 ESCUTCHEONS

Escutcheons shall be provided at finished surfaces where bare or insulated piping, exposed to view, passes through floors, walls, or ceilings, except in boiler, utility, or equipment rooms. Escutcheons shall be fastened securely to pipe or pipe covering and shall be satin-finish, corrosion-resisting steel, polished chromium-plated zinc alloy, or polished

chromium-plated copper alloy. Escutcheons shall be either one-piece or split-pattern, held in place by internal spring tension or setscrew.

3.4 TESTS, FLUSHING AND DISINFECTION

3.4.1 Plumbing System

The following tests shall be performed on the plumbing system in accordance with , except that the drainage and vent system final test shall include the smoke test. The Contractor has the option to perform a peppermint test in lieu of the smoke test. If a peppermint test is chosen, the Contractor must submit a testing procedure to the Contracting Officer for approval.

a. Drainage and Vent Systems Test. The final test shall include a smoke test.

b. Building Sewers Tests.

c. Water Supply Systems Tests.

3.4.2 Defective Work

If inspection or test shows defects, such defective work or material shall be replaced or repaired as necessary and inspection and tests shall be repeated. Repairs to piping shall be made with new materials. Caulking of screwed joints or holes will not be acceptable.

3.4.3 System Flushing

3.4.3.1 During Flushing

Before operational tests or disinfection, potable water piping system shall be flushed with potable water. Sufficient water shall be used to produce a water velocity that is capable of entraining and removing debris in all portions of the piping system. This requires simultaneous operation of all fixtures on a common branch or main in order to produce a flushing velocity of approximately 4 fps through all portions of the piping system. In the event that this is impossible due to size of system, the Contracting Officer (or the designated representative) shall specify the number of fixtures to be operated during flushing. Contractor shall provide adequate personnel to monitor the flushing operation and to ensure that drain lines are unobstructed in order to prevent flooding of the facility. Contractor shall be responsible for any flood damage resulting from flushing of the system. Flushing shall be continued until entrained dirt and other foreign materials have been removed and until discharge water shows no discoloration. All faucets shall be flushed a minimum of 0.25 gallons per 24 hour period, ten times over a 14 day period.

3.4.4 Operational Test

Upon completion of flushing and prior to disinfection procedures, the Contractor shall subject the plumbing system to operating tests to demonstrate satisfactory installation, connections, adjustments, and functional and operational efficiency. Such operating tests shall cover a period of not less than 8 hours for each system and shall include the following information in a report with conclusion as to the adequacy of the system:

a. Time, date, and duration of test.

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b. Water pressures at the most remote and the highest fixtures.

c. Operation of each fixture and fixture trim.

d. Operation of each valve, hydrant, and faucet.

3.4.5 Disinfection

After operational tests are complete, the entire domestic hot- and cold-water distribution system shall be disinfected. System shall be flushed as specified, before introducing chlorinating material. The chlorinating material shall be hypochlorites or liquid chlorine. Except as herein specified, water chlorination procedure shall be in accordance with AWWA C651 and AWWA C652. The chlorinating material shall be fed into the water piping system at a constant rate at a concentration of at least 50 parts per million (ppm). A properly adjusted hypochlorite solution injected into the main with a hypochlorinator, or liquid chlorine injected into the main through a solution-feed chlorinator , shall be used. If after the 24 hour and 6 hour holding periods, the residual solution contains less than 25 ppm and 50 ppm chlorine respectively, flush the piping and tank with potable water, and repeat the above procedures until the required residual chlorine levels are satisfied. The system including the tanks shall then be flushed with clean water until the residual chlorine level is reduced to less than one part per million. During the flushing period each valve and faucet shall be opened and closed several times. Samples of water in disinfected containers shall be obtained from several locations selected by the Contracting Officer.

The samples of water shall be tested for total coliform organisms (coliform bacteria, fecal coliform, streptococcal, and other bacteria) in accordance with AWWA 10084. The testing method used shall be EPA approved for drinking water systems and shall comply with applicable local and state requirements.

Disinfection shall be repeated until tests indicate the absence of coliform organisms (zero mean coliform density per 100 milliliters) in the samples for at least 2 full days. The system will not be accepted until satisfactory bacteriological results have been obtained.

3.5 PERFORMANCE OF WATER HEATING EQUIPMENT

Standard rating condition terms are as follows:

EF = Energy factor, minimum overall efficiency.

ET = Minimum thermal efficiency with 70 degrees F delta T.

SL = Standby loss is maximum (Btu/h) based on a 70 degrees F temperature difference between stored water and ambient requirements.

V = Rated volume in gallons

Q = Nameplate input rate in kW (Btu/h)

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3.6 TABLES

TABLE I
PIPE AND FITTING MATERIALS FOR
DRAINAGE, WASTE, AND VENT PIPING SYSTEMS

Item #	Pipe and Fitting Materials	SERVICE A	B	C	D	E	F
1	Polyvinyl Chloride plastic drain, waste and vent pipe and fittings, ASTM D 2665, ASTM F 891, (Sch 40) ASTM F 1760	X	X	X	X	X	X

SERVICE:

A - Underground Building Soil, Waste and Storm Drain
B - Aboveground Soil, Waste, Drain In Buildings
C - Underground Vent
D - Aboveground Vent
E - Interior Rainwater Conductors Aboveground
F - Corrosive Waste And Vent Above And Belowground
* - Hard Temper

TABLE II
PIPE AND FITTING MATERIALS FOR PRESSURE PIPING SYSTEMS

Item No.	Pipe and Fitting Materials	SERVICE A	B	C	D
8	Seamless copper water tube, ASTM B 88, ASTM B 88M	X**	X**	X**	X***
38	Press Fittings	X	X		

A - Cold Water Service Aboveground
B - Hot and Cold Water Distribution 180 degrees F Maximum Aboveground
C - Compressed Air Lubricated
D - Cold Water Service Belowground
Indicated types are minimum wall thicknesses.
** - Type L - Hard
*** - Type K - Hard temper with brazed joints only or type K-soft temper without joints in or under floors

-- End of Section --

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SECTION 26 20 00

INTERIOR DISTRIBUTION SYSTEM
08/08

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM B 1	(2001; R 2007) Standard Specification for Hard-Drawn Copper Wire
ASTM B 8	(2004) Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2	(2007; Errata 2006; Errata 2007; INT 44-56 2007; INT 47, 49, 50, 52-56 2008; INT 57, 58, 51, 48 2009) National Electrical Safety Code

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA C80.1	(2005) Standard for Electrical Rigid Steel Conduit (ERSC)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2008; AMD 1 2008) National Electrical Code - 2008 Edition

UNDERWRITERS LABORATORIES (UL)

UL 4	(2004; Rev thru Oct 2008) Armored Cable
UL 486A-486B	(2003; Rev thru Apr 2009) Standard for Wire Connectors
UL 486C	(2004; Rev thru Apr 2009) Standard for Splicing Wire Connectors
UL 489	(2002; Rev thru Mar 2009) Standard for Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
UL 50	(2007) Standard for Enclosures for Electrical Equipment
UL 510	(2005; Rev thru Aug 2005) Polyvinyl Chloride, Polyethylene, and Rubber

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	Insulating Tape
UL 514A	(2004; Rev thru Aug 2007) Standard for Metallic Outlet Boxes
UL 514B	(2004; Rev thru Aug 2007) Standard for Conduit, Tubing and Cable Fittings
UL 6	(2007) Standard for Electrical Rigid Metal Conduit-Steel
UL 83	(20086) Standard for Thermoplastic-Insulated Wires and Cables

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

Materials, equipment, and devices shall, as a minimum, meet requirements of UL, where UL standards are established for those items, and requirements of NFPA 70.

2.2 CONDUIT AND FITTINGS

Shall conform to the following:

2.2.1 Rigid Metallic Conduit

2.2.1.1 Rigid, Threaded Zinc-Coated Steel Conduit

NEMA C80.1, UL 6.

2.2.2 Fittings for Metal Conduit

UL 514B. Ferrous fittings shall be cadmium- or zinc-coated in accordance with UL 514B.

2.2.2.1 Fittings for Rigid Metal Conduit

Threaded-type. Split couplings unacceptable.

2.3 OUTLET BOXES AND COVERS

UL 514A, cadmium- or zinc-coated, if ferrous metal.

2.4 CABINETS, JUNCTION BOXES, AND PULL BOXES

Volume greater than 100 cubic inches, UL 50, hot-dip, zinc-coated, if sheet steel.

2.5 WIRES AND CABLES

Wires and cables shall meet applicable requirements of NFPA 70 and UL for type of insulation, jacket, and conductor specified or indicated. Wires and cables manufactured more than 12 months prior to date of delivery to site shall not be used.

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2.5.1 Conductors

Conductors No. 8 AWG and larger diameter shall be stranded. Conductors No. 10 AWG and smaller diameter shall be solid, except that conductors for remote control, alarm, and signal circuits, classes 1, 2, and 3, shall be stranded unless specifically indicated otherwise. Conductor sizes and capacities shown are based on copper, unless indicated otherwise. All conductors shall be copper.

2.5.1.1 Minimum Conductor Sizes

Minimum size for branch circuits shall be No. 12 AWG; for Class 1 remote-control and signal circuits, No. 14 AWG; for Class 2 low-energy, remote-control and signal circuits, No. 16 AWG; and for Class 3 low-energy, remote-control, alarm and signal circuits, No. 22 AWG.

2.5.2 Color Coding

Provide for service, feeder, branch, control, and signaling circuit conductors. Color shall be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in same raceway or box, other neutrals shall be white with a different colored (not green) stripe for each. Color of ungrounded conductors in different voltage systems shall be as follows:

a. 120/240 volt, single phase: Black and red

2.5.3 Insulation

Unless specified or indicated otherwise or required by NFPA 70, power and lighting wires shall be 600-volt, Type THWN/THHN conforming to UL 83, except that grounding wire may be type TW conforming to UL 83; remote-control and signal circuits shall be Type TW or TF, conforming to UL 83. Where lighting fixtures require 90-degree Centigrade (C) conductors, provide only conductors with 90-degree C insulation or better.

2.5.4 Bonding Conductors

ASTM B 1, solid bare copper wire for sizes No. 8 AWG and smaller diameter; ASTM B 8, Class B, stranded bare copper wire for sizes No. 6 AWG and larger diameter.

2.5.5 Armored Cable

UL 4; NFPA 70, Type AC cable.

2.6 SPLICES AND TERMINATION COMPONENTS

UL 486A-486B for wire connectors and UL 510 for insulating tapes. Connectors for No. 10 AWG and smaller diameter wires shall be insulated, pressure-type in accordance with UL 486A-486B or UL 486C (twist-on splicing connector). Provide solderless terminal lugs on stranded conductors.

2.7 ENCLOSED CIRCUIT BREAKERS

UL 489. Individual molded case circuit breakers with voltage and continuous current ratings, number of poles, overload trip setting, and short circuit current interrupting rating as indicated. Enclosure type as indicated.

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PART 3 EXECUTION

3.1 INSTALLATION

Electrical installations, including weatherproof and hazardous locations and ducts, plenums and other air-handling spaces, shall conform to requirements of NFPA 70 and IEEE C2 and to requirements specified herein.

3.1.1 Wiring Methods

Provide insulated conductors installed in rigid steel conduit except where specifically indicated or specified otherwise or required by NFPA 70 to be installed otherwise. Grounding conductor shall be separate from electrical system neutral conductor. Provide insulated green equipment grounding conductor for circuit(s) installed in conduit and raceways. Shared neutral, or multi-wire branch circuits, are not permitted with arc-fault circuit interrupters. Minimum conduit size shall be 1/2 inch in diameter for low voltage lighting and power circuits. Vertical distribution in multiple story buildings shall be made with metal conduit in fire-rated shafts. Metal conduit shall extend through shafts for minimum distance of 6 inches.

3.1.2 Conduit Installation

Unless indicated otherwise, conceal conduit under floor slabs and within finished walls, ceilings, and floors. Keep conduit minimum 6 inches away from parallel runs of flues and steam or hot water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members where located above accessible ceilings and where conduit will be visible after completion of project.

3.1.2.1 Conduit Support

Support conduit by pipe straps, wall brackets, hangers, or ceiling trapeze. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete or brick; and by machine screws, welded threaded studs, or spring-tension clamps on steel work. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. Load applied to fasteners shall not exceed one-fourth proof test load. Fasteners attached to concrete ceiling shall be vibration resistant and shock-resistant. Holes cut to depth of more than 1 1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete joints shall not cut main reinforcing bars. Fill unused holes. In partitions of light steel construction, use sheet metal screws. In suspended-ceiling construction, run conduit above ceiling. Do not support conduit by ceiling support system. Conduit and box systems shall be supported independently of both (a) tie wires supporting ceiling grid system, and (b) ceiling grid system into which ceiling panels are placed. Supporting means shall not be shared between electrical raceways and mechanical piping or ducts. Installation shall be coordinated with above-ceiling mechanical systems to assure maximum accessibility to all systems. Spring-steel fasteners may be used for lighting branch circuit conduit supports in suspended ceilings in dry locations.

3.1.2.2 Directional Changes in Conduit Runs

Make changes in direction of runs with symmetrical bends or cast-metal

fittings. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. .

3.1.2.3 Locknuts and Bushings

Fasten conduits to sheet metal boxes and cabinets with two locknuts where required by NFPA 70, where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use at least minimum single locknut and bushing. Locknuts shall have sharp edges for digging into wall of metal enclosures. Install bushings on ends of conduits, and provide insulating type where required by NFPA 70.

3.1.3 Boxes, Outlets, and Supports

Provide boxes in wiring and raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be cast-metal. Boxes in other locations shall be sheet steel. Each box shall have volume required by NFPA 70 for number of conductors enclosed in box. Boxes for mounting lighting fixtures shall be minimum 4 inches square, or octagonal, except that smaller boxes may be installed as required by fixture configurations, as approved. Boxes for use in masonry-block or tile walls shall be square-cornered, tile-type, or standard boxes having square-cornered, tile-type covers. Provide gaskets for cast-metal boxes installed in wet locations and boxes installed flush with outside of exterior surfaces. Provide separate boxes for flush or recessed fixtures when required by fixture terminal operating temperature; fixtures shall be readily removable for access to boxes unless ceiling access panels are provided. Support boxes and pendants for surface-mounted fixtures on suspended ceilings independently of ceiling supports. Fasten boxes and supports with wood screws on wood, with bolts and expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screws or welded studs on steel. In open overhead spaces, cast boxes threaded to raceways need not be separately supported except where used for fixture support; support sheet metal boxes directly from building structure or by bar hangers. Where bar hangers are used, attach bar to raceways on opposite sides of box, and support raceway with approved-type fastener maximum 24 inches from box. When penetrating reinforced concrete members, avoid cutting reinforcing steel.

3.1.3.1 Boxes

Boxes for use with raceway systems shall be minimum 1 1/2 inches deep, except where shallower boxes required by structural conditions are approved. Boxes for other than lighting fixture outlets shall be minimum 4 inches square, except that 4 by 2 inch boxes may be used where only one raceway enters outlet.

3.1.4 Conductor Identification

Provide conductor identification within each enclosure where tap, splice, or termination is made. For conductors No. 6 AWG and smaller diameter, color coding shall be by factory-applied, color-impregnated insulation. For conductors No. 4 AWG and larger diameter, color coding shall be by plastic-coated, self-sticking markers; colored nylon cable ties and plates; or heat shrink-type sleeves.

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3.1.5 Splices

Make splices in accessible locations. Make splices in conductors No. 10 AWG and smaller diameter with insulated, pressure-type connector. Make splices in conductors No. 8 AWG and larger diameter with solderless connector, and cover with insulation material equivalent to conductor insulation.

3.1.6 Electrical Penetrations

Seal openings around electrical penetrations through walls, partitions, floors, or ceilings in accordance with Section 07 92 00, JOINT SEALANTS.

3.1.7 Grounding and Bonding

Provide In accordance with NFPA 70.

3.1.8 Repair of Existing Work

Repair of existing work[, demolition, and modification of existing electrical distribution systems] shall be performed as follows:

3.1.8.1 Workmanship

Lay out work in advance. Exercise care where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, or other surfaces is necessary for proper installation, support, or anchorage of conduit, raceways, or other electrical work. Repair damage to buildings, piping, and equipment using skilled craftsmen of trades involved.

-- End of Section --

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SECTION 31 23 00.00 20

EXCAVATION AND FILL
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 698	(2007e1) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

CID A-A-1909	(Basic Notice 1; Canc. Notice 2) Fertilizer

PART 3 EXECUTION

2.1 EXCAVATION

Excavate to contours, elevation, and dimensions indicated. Reuse excavated materials that meet the specified requirements for the material type required at the intended location. Keep excavations free from water. Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Excavations below indicated depths will not be permitted except to remove unsatisfactory material. Unsatisfactory material encountered below the grades shown shall be removed. Refill with backfill and fill material and compact to 95 percent of ASTM D 698] maximum density. Unless specified otherwise, refill excavations cut below indicated depth with backfill and fill material and compact to 95 percent of ASTM D 698 maximum density. Satisfactory material removed below the depths indicated, without specific direction of the Contracting Officer, shall be replaced with satisfactory materials to the indicated excavation grade; except as specified for spread footings.

2.1.1 Pipe Trenches

Excavate to the dimension indicated. Grade bottom of trenches to provide uniform support for each section of pipe after pipe bedding placement. Tamp if necessary to provide a firm pipe bed. Recesses shall be excavated to accommodate bells and joints so that pipe will be uniformly supported for the entire length. Rock, where encountered, shall be excavated to a depth of at least 6 inches below the bottom of the pipe.

2.1.2 Excavated Materials

Satisfactory excavated material required for fill or backfill shall be placed in the proper section of the permanent work required or shall be separately stockpiled if it cannot be readily placed. Satisfactory material

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in excess of that required for the permanent work and all unsatisfactory material shall be disposed of as specified in Paragraph "DISPOSITION OF SURPLUS MATERIAL."

2.2 FILLING AND BACKFILLING

Fill and backfill to contours, elevations, and dimensions indicated. Compact each lift before placing overlaying lift.

2.2.1 Common Fill Placement

Provide for general site. Place in 6 inch lifts. Compact areas not accessible to rollers or compactors with mechanical hand tampers. Aerate material excessively moistened by rain to a satisfactory moisture content.

2.2.2 Backfill and Fill Material Placement

Provide for paved areas and under concrete slabs, except where select material is provided. Place in 6 inch lifts. Do not place over wet or frozen areas. Place backfill material adjacent to structures as the structural elements are completed and accepted. Backfill against concrete only when approved. Place and compact material to avoid loading upon or against the structure.

2.2.3 Backfill and Fill Material Placement Over Pipes and at Walls

Backfilling shall not begin until construction below finish grade has been approved, underground utilities systems have been inspected, tested and approved, forms removed, and the excavation cleaned of trash and debris. Backfill shall be brought to indicated finish grade. Where pipe is coated or wrapped for protection against corrosion, the backfill material up to an elevation 2 feet above sewer lines and 1 foot above other utility lines shall be free from stones larger than 1 inch in any dimension. Heavy equipment for spreading and compacting backfill shall not be operated closer to foundation or retaining walls than a distance equal to the height of backfill above the top of footing; the area remaining shall be compacted in layers not more than 4 inches in compacted thickness with power-driven hand tampers suitable for the material being compacted. Backfill shall be placed carefully around pipes or tanks to avoid damage to coatings, wrappings, or tanks. As far as practicable, backfill shall be brought up evenly on each side of the wall and sloped to drain away from the wall.

2.2.4 Trench Backfilling

Backfill as rapidly as construction, testing, and acceptance of work permits. Place and compact backfill under structures and paved areas in 6 inch lifts to top of trench and in 6 inch lifts to one foot over pipe outside structures and paved areas.

2.3 BURIED WARNING AND IDENTIFICATION TAPE

Provide buried utility lines with utility identification tape. Bury tape 12 inches below finished grade; under pavements and slabs, bury tape 6 inches below top of subgrade.

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2.4 FINISH OPERATIONS

2.4.1 Grading

Finish grades as indicated within one-tenth of one foot. Grade areas to drain water away from structures. Maintain areas free of trash and debris. For existing grades that will remain but which were disturbed by Contractor's operations, grade as directed.

2.4.2 Topsoil and Seed

Scarify existing subgrade. Provide 4 inches of topsoil for newly graded finish earth surfaces and areas disturbed by the Contractor. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to seeding, planting, or proper grading. Seed shall match existing vegetation. Provide seed at 5 pounds per 1000 square feet. Provide CID A-A-1909, Type I, Class 2, 10-10-10 analysis fertilizer at 25 pounds per 1000 square feet. Provide mulch and water to establish an acceptable stand of grass.

2.4.3 Protection of Surfaces

Protect newly backfilled, graded, and topsoiled areas from traffic, erosion, and settlements that may occur. Repair or reestablish damaged grades, elevations, or slopes.

2.5 DISPOSITION OF SURPLUS MATERIAL

Remove from Government property surplus or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber.

-- End of Section --

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